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Strengthening Cutaneous Leishmaniasis control in Guatemala: policy recommendations*

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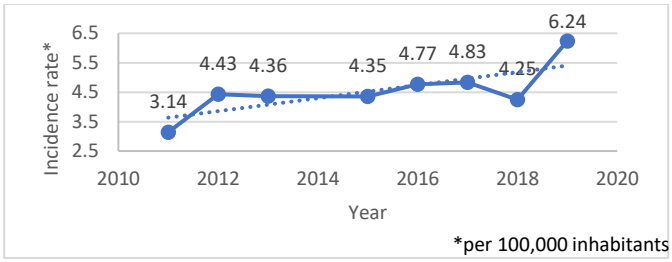
The problem. The country incidence rate of cutaneous leishmaniasis (CL) in Guatemala has increased from 3.14 per 100,000 inhabitants in 2011 to 6.24 per 100,000 inhabitants in 2019, (**Fig.1**) (1), probably due to a combination of improved active surveillance (2), climate changes (3,4), and occupational activities involving continued forest contact (5) among others. A national control program has been in place since 2003, but continued efforts are generating uneven results for the different endemic communities. Nationwide actions for CL control include active and passive surveillance, diagnosis and treatment offered free of cost by the Ministry of Health (MoH) and awareness-raising activities. We explored barriers and facilitators of CL control in Guatemala as experienced and perceived by service users and providers in order to inform evidence-based strategies to strengthen CL control in the country.

Data were collected via focus groups and semi-structured interviews with key stakeholders, including local and national health personnel and residents of four endemic communities. It was analyzed via thematic and content analysis using NVIVO qualitative data analysis software.

Figure 1. Cutaneous Leishmaniasis country incidence rate (2011-2019).



Scope of the problem. A total of 4,262,387 people are estimated to be at risk of contracting CL in Guatemala, mostly in six northern departments (Petén, Alta Verapaz, Izabal, Quiché, Huehuetenango and El Progreso) (6). Alta Verapaz, the department where our study was conducted, registered 58% of cases in 2019, with an incidence rate of 72.26 per 100,000 (7). Active surveillance activities are scarce and passive surveillance is known to cause incidence underestimation (2), meaning that the actual incidence is likely to be much higher. Two thirds of the population in endemic areas live below the poverty threshold and half of

(*) Derived from the Embedding Research for the Sustainable Development Goals: STRENGTHENING HEALTH PROGRAMS, POLICIES AND SYSTEMS IN LATIN AMERICA AND THE CARIBBEAN. Joint initiative between the Pan American Health Organization (PAHO), the Alliance for Health Policy and Systems Research (Alliance HPSR) and the Special Programme for Research and Training in Tropical Diseases (TDR)

them lack access to public health services, which further limits diagnosis and treatment (8).

CL surveillance and control in Guatemala is based on the Leishmaniasis program (in Spanish, *Programa de Leishmaniasis*), which is part of the country's Vector-Borne Disease Program (VDP). The CL program is led by one MoH official exclusively dedicated to CL control and who, with support of national entomological, epidemiological surveillance and laboratory diagnosis facilities and staff, is responsible for nationwide activities. The remaining personnel combine CL control alongside various other vector-borne diseases control programs (9). The program also benefits from financial and technical assistance from Non-Governmental Organizations and the academy, and since 2014 has also received economic and technical support from PAHO/WHO.

Our research indicates that limited economic resources dedicated to CL control and associated diagnostic and treatment supplies shortages negatively impact CL detection and treatment. In addition, local health personnel rotates frequently and often lack CL training and access to the national guidelines for CL prevention and control, which further limits policy implementation. With regards to the population at risk living in endemic areas, misunderstanding of the disease and its cause and long, often uncertain, waiting times for diagnosis and treatment negatively affect people's willingness to seek help, as well as their trust and reliance on the health care system.

Procurement problems: From the list of treatment options included in the therapeutic guidelines for leishmaniasis in the Americas (10) the MoH only uses meglumine antimoniate (MA), (11–13) given the scientific evidence of high response rates to this drug in Guatemala (14,15). Procurement of this drug is subject to long administrative procedures that often cause stock shortages in local health centers and treatment delays. According to health personnel and residents of endemic areas, once diagnosis has been established, people can wait from 6 to 12 months to receive treatment. This results in treatment dropouts, low treatment adherence and community member's reluctance to seek the advice from health professionals.

> *"We go to the health services to lose our time …because there is no medicine…".*
>
> **Resident of CL endemic area**

In addition to negatively affecting procurement and staff numbers (and therefore cure rates), the limited funds available for CL control also hamper current CL control efforts through hindering active and passive surveillance. Most notably, this is because health personnel have no adequate transport to reach the affected communities as frequently as needed. It is often the case that health staff end up visiting affected communities for active surveillance and treatment by foot or paying local public transport from their own pocket.

> *"…by foot [it takes] 45 minutes. And if we pay a tuc tuc* [motorized tricycle] *it´s Q15.00* [$2.00 USD]… *an extra expense we cover from our own pocket".*
>
> **Vector Disease Program officer**

During focus groups, some residents of all four endemic communities also declared walking or investing a significant part of their reduced assets to get to the health facilities. Many however admitted being unable to do so.

Lack of preventive measures: Despite current efforts, it is necessary to improve and systematize entomological surveillance activities to know the distribution of the parasite, vector or reservoir, because there is a scarcity of information on the cycles of transmission of CL and incrimination of vector and reservoirs species, as well as the distribution of parasites in all endemic areas. In addition, no targeted educational campaigns take place within the affected communities. Preventive measures are reduced to awareness-raising conversations held between health workers and community residents during active surveillance of cases.

Program evaluation deficiencies: Leishmaniasis control guidelines do not mention program monitoring and evaluation or indicate evaluation indicators. There are no records of the effectiveness, efficiency, and impact of the program, which limits targeted improvement measures and the identification of policy issues to consider.

Short- and long-term effects of program limitations. The above-mentioned problems obstruct current CL control through various overlapping mechanisms. Despite the number of people diagnosed to be suffering from CL is high and rising (see Fig 1), qualitative information reveals that not all affected individuals receive timely treatment. Both in the long and short term:

- Lack of CL training of local health personnel decreases both the effectiveness of awareness-raising activities and workers' opportunities to effectively identify CL cases during surveillance, adversely affecting infection and treatment rates.
- Procurement difficulties and associated treatment shortages negatively affect treatment rates, and push people to seek community-based treatments that often involve applying battery liquid, nail polish, crushed chili, fire and gunpowder directly on the ulcers.
- Treatment with MA is costly, painful and cannot be administered to all affected individuals (e.g. pregnant and nursing women, children under 12 months, and people affected by heart, liver or kidney diseases). This unfavorably affects cure rates. People's fear of painful injections also negatively impacts on treatment rates as people often refuse to seek the advice of health professionals because of fear of the treatment.

People living with a CL ulcer often experience co-infections, shame and aversion due to misunderstandings about the cause of the disease and associated stigma. When superinfected, active ulcers are extremely painful and often limit people's ability to work. Thus, deteriorate both the family and the community´s economy. The socioeconomic burden of CL has however not been measured in Guatemala.

Policy recommendations: CL control efforts in Guatemala follow the guidelines of three main official operational documents (epidemiological surveillance protocols for vector-borne diseases, manual of procedures for the prevention and control of leishmaniasis, and comprehensive health care standards for the first and second level). These documents highlight the epidemiological characteristics of CL, prevention measures, diagnostic procedures and treatment options. They also detail responsibilities according to the level of care (preventive actions at the first level, identification and treatment for the second level, and state follow-up of complicated cases at the third level). However, follow up and evaluation protocols are not covered in detail in any technical documents and, together with CL prevention, they are the most unattended activities.

Addressing gaps in the national guidelines is of vital importance, as staff training should be based on these guidelines, which should also be accessed and consulted constantly by health workers. There are however important challenges to the implementation of the activities recommended in the existing program, mainly due to lack of resources, both in terms of funds dedicated to CL control and in terms of human resources. Involving trained and paid community health workers may help overcome these problems. Combining health education, vector prevention and control and community participation has proved to be effective in preventing and controlling CL in various countries (16–18). Regarding the above-mentioned procurement and treatment problems, thermotherapy has been shown to be more cost-effective than MA to treat CL and to cause fewer side effects (14,19). Its inclusion in the national treatment protocols can help increase cure rates and reduce program costs, but its use is still not implemented as a national strategy.

Summary and call to action: Known CL cases concentrate in the northern regions of the country, particularly in Petén and Alta Verapaz, where our study was conducted. We explored barriers and facilitators of CL control as experienced and perceived by health personnel and residents of endemic areas in order to inform evidence-based strategies able to strengthen CL control in the country.

Our research indicates that the main challenges to successful CL control in the country can be summarized as: staff training needs, transport deficits that limit surveillance and treatment, drug procurement and associated treatment shortages and delays, absence of preventive activities and non-existence of evaluative measures.

There has been an improvement in surveillance, diagnosis and treatment over the last years, but the real magnitude of the problem remains largely unknown. This in turn, negatively influences the funding allocated to controlling this disease. Providing health workers with transport (tricycles for instance) and/or organizing fortnightly buses so that people living in endemic communities can reach the health centers will help strengthen active and passive surveillance.

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There are insufficient and poorly trained personnel at the local level, who often lack the necessary resources to carry out their work. Ensuring that staff has access to existing guidelines and protocols and involving trained community health workers in CL efforts could help strengthen active surveillance, treatment and cure rates.

The implementation of preventive measures is necessary to decrease incidence rates. Updated vector incrimination information is needed, and culturally appropriate educational materials and actions must be developed. The MoH's Department of Health Promotion and Education (PROEDUSA) should produce culturally competent informative material in the local language (Q´eqchi´) to strengthen prevention, treatment, and to avoid social stigma among affected individuals. The incorporation of CL educational material within the school curriculum in the endemic areas is also recommended. CL audio spots in Q´eqchi´ for community radio stations can also help strengthen preventive action (20).

The MoH must seek measures to secure stock of supplies as well as investigate whether thermotherapy can be systematized as an alternative treatment method.

Finally, programmatic monitoring and evaluative interventions are imperative to guarantee the continuous improvement of the national CL program and its associated activities.

Highlights

- Ensure staff is trained on CL prevention and management and has access to the national guidelines for CL control.
- Guarantee meglumine antimoniate procurement to avoid treatment shortages and delays and systematize thermotherapy as an alternative treatment
- Strengthen preventive activities.
- Increase active surveillance.
- Incorporate regular monitoring and evaluation of program and associated activities.

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